

What is claimed is:

1. A spark plug comprising:

a center electrode;

5 an insulator holding said center electrode;

a housing holding and fixing said insulator; and

a ground electrode having one end portion connected to said housing and the other end portion opposed to said center electrode via a discharge gap intervening therebetween,

10 wherein an Ir alloy firing tip made of a rod-like Ir alloy is connected to a portion of at least one of said center electrode and said ground electrode facing to said discharge gap,

a cross-sectional area of said Ir alloy firing tip taken along a plane perpendicular to an axis of said Ir alloy firing tip has an out-of-round configuration,

15 in said cross-sectional area of said Ir alloy firing tip, when it is assumed that a circumscribed circle has a largest diameter A among virtual circles each contacting at least three portions of a visible outline of said cross-sectional area and an inscribed circle has a largest diameter B among inscribed circles each being coaxial with said circumscribed circle, a ratio

20 of said diameter B to said diameter A (i.e.,  $B/A$ ) is equal to or larger than 0.8 and is less than 1.0,

the visible outline of said cross-sectional area is constituted by a serial joint of at least seven straight or curved line elements, and

25 an angle between each line element and an adjacent line element is not less than  $125^\circ$  and is not larger than  $235^\circ$ .

2. The spark plug in accordance with claim 1, wherein said ratio  $B/A$  is not larger than 0.96.

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3. The spark plug in accordance with claim 1, wherein the diameter A of said circumscribed circle is not less than 0.3 mm and is not larger than 1.5 mm.

5           4. The spark plug in accordance with claim 1, wherein said Ir alloy firing tip includes Ir of 50 % or more by weight and at least one additive, and has a melting point not lower than 2,000 °C.

10           5. The spark plug in accordance with claim 4, wherein said at least one additive contained in said Ir alloy firing tip is selected from the group consisting of Pt, Rh, Ni, W, Pd, Ru, Os, Al, Y, and  $Y_2O_3$ .

15           6. A method for manufacturing a spark plug including a center electrode, an insulator holding said center electrode, a housing holding and fixing said insulator, and a ground electrode having one end portion connected to said housing and the other end portion opposed to said center electrode via a discharge gap intervening therebetween,

20           wherein an Ir alloy firing tip made of a rod-like Ir alloy is connected to a portion of at least one of said center electrode and said ground electrode facing to said discharge gap, and a cross-sectional area of said Ir alloy firing tip taken along a plane perpendicular to an axis of said Ir alloy firing tip has an out-of-round configuration,

25           in said cross-sectional area of said Ir alloy firing tip, when it is assumed that a circumscribed circle has a largest diameter A among virtual circles each contacting at least three portions of a visible outline of said cross-sectional area and an inscribed circle has a largest diameter B among inscribed circles each being coaxial with said circumscribed circle, a ratio of said diameter B to said diameter A (i.e.,  $B/A$ ) is equal to or larger than 0.8 and is less than 1.0,

30           wherein said manufacturing method includes the steps of:

configuring said cross-sectional area of said Ir alloy firing tip in such a manner that the visible outline is constituted by a serial joint of at least seven straight or curved line elements and an angle between each line element and an adjacent line element is not less than 125° and not larger  
5 than 235°, and

welding an entire circumferential surface of said Ir alloy firing tip by laser welding to said portion of at least one of said center electrode and said ground electrode facing to said discharge gap.